

**WHAT IS CLAIMED IS:**

1. A method of performing load distribution between the plurality of Broadband Remote Access Servers ("BRASs"), the method comprising:
  - 5       conveying individual load information about each BRAS in the plurality of BRASs to at least one Ethernet access node,
  - building, by the at least one Ethernet access node, a database of available BRASs based on the conveyed individual load information,
  - storing, into the database, address and load information about each
  - 10       BRAS in the plurality of available BRASs,
  - receiving an initiation message by the at least one Ethernet access node,
  - determining a preferred BRAS by analyzing the load information stored in the database, and
  - forwarding the initiation message to the preferred BRAS.
- 15       2. A method of performing load distribution between a plurality of BRASs, the method comprising:
  - conveying individual load information about each BRAS in the plurality of BRASs to a mediation device,
  - 20       building, by the mediation device, a database of available BRASs based on the conveyed individual load information,
  - storing, into the database, address and load information about each BRAS in the plurality of available BRASs,
  - receiving an initiation message by an Ethernet access node,
  - 25       forwarding the initiation message to the mediation device,
  - determining, by the mediation device, a preferred BRAS by analyzing the load information stored in the database, and
  - forwarding the initiation message to the preferred BRAS.
- 30       3. A method of performing load distribution between a plurality of BRASs, the method comprising:
  - conveying individual load information about each BRAS in the plurality of

-18-

BRASs to a mediation device,

building, by the mediation device, a database of available BRASs based on the conveyed load information,

storing, into the database, address and load information about each  
5 BRAS in the plurality of available BRASs,

distributing the database to at least one Ethernet access node,

receiving an initiation message by the at least one Ethernet access node,

determining, by the at least one Ethernet access node, a preferred BRAS  
by analyzing the load information stored in the database, and

10 forwarding the discovery initiation message to the preferred BRAS.

4. The method of claim 2 wherein the forwarding the initiation message to a mediation device comprises substituting a destination broadcast address of the initiation message to the MAC address of the mediation device.

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5. The method of claim 2 wherein the forwarding the initiation message to a mediation device comprises substituting a destination broadcast address of the initiation message with a predefined broadcast address of a mediation device cluster.

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6. The method of claim 2 wherein the forwarding the initiation message to a mediation device comprises forwarding the initiation message to a mediation device in a VLAN which is isolated from the plurality of BRASs.

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7. The method of claims 1, 2 or 3 wherein the conveying further comprises receiving a plurality of broadcast messages from each BRAS in the plurality of BRASs, wherein each broadcast contains address information and information regarding load status for the respective BRAS.

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8. The method of claims 1, 2 or 3 wherein the conveying further comprises polling each BRAS in the plurality of BRASs to obtain information regarding load status the respective BRAS.

-19-

9. The method of claim 8 wherein the polling may be implemented using SNMP.
10. The method of claims 1, 2 or 3 wherein the conveying is performed at a  
5 predetermined intervals.
11. The method of claim 8 wherein the polling is performed whenever a new Point-to-Point Protocol over Ethernet ("PPPoE") session is established.
- 10 12. The method of claims 1, 2 or 3 wherein the forwarding the initiation message to the preferred BRAS further comprises changing the destination address from the Ethernet broadcast address to the MAC address of the preferred BRAS.
- 15 13. The method of claims 1, 2 or 3 wherein the address information includes the MAC address for each BRAS.
14. The method of claims 1, 2 or 3 wherein the load information includes percent of maximum load for each respective BRAS.
- 20 15. The method of claims 1, 2, or 3 wherein the initiation message is a PPPoE Active Discovery Initiation message.
16. The method of claims 1, 2, or 3 further comprising:  
25 repeating the conveying at configurable intervals,  
updating the database if new information from the conveying is received.
17. The method of claims 1, 2, or 3 further comprising:  
30 receiving a requested service in the initiation message,  
verifying that the requested service is available on preferred BRAS, and  
if the requested service is not available, selecting another BRAS from the plurality of available BRASs.

-20-

18. A method for performing load distribution among a plurality of access concentrators in a network, the method comprising:

5 sending, by a host, a broadcast message to the plurality of access concentrators,

determining, by at least one access concentrator of the plurality of access concentrators, a load on the at least one access concentrator in response to receiving the broadcast message,

10 waiting a period of time before sending a response message to the broadcast message, wherein the period of time is a function of the load on the at least one access concentrator,

receiving, by the host, a plurality of response messages in response to the broadcast message,

15 determining, based on the plurality of response messages, the plurality of access concentrators which are capable of fulfilling predetermined service requirements of the host, and

20 selecting an access concentrator from the plurality of access concentrators, wherein the selected access concentrator sent the first response message to the host, such that the host can establish a PPP session with the selected access concentrator.

19. A method for performing load distribution among a plurality of access concentrators in a network, the method comprising:

25 receiving a broadcast message addressed to the plurality of access concentrators,

recording the MAC address of a sender of the broadcast message,

forwarding the broadcast message onto the plurality of access concentrators,

30 intercepting a plurality of response messages addressed to the sender of the broadcast message,

selecting the access concentrator having been the first to forward a respective response message,

-21-

forwarding the response from the selected access concentrator,  
wherein each plurality of access concentrators determines the load on the  
respective access concentrator in response to receiving the broadcast message  
and waits a period of time before sending a response message to the broadcast  
message, wherein the period of time is a function of the load on the at least one  
access concentrator, such that a sender can establish a PPP session with the  
selected access concentrator.

20. A network node comprising:

a processor,

a network interface in communication with the processor, and

a memory coupled to the processor, wherein the memory includes  
instructions for:

15 sending a broadcast message to a plurality of access  
concentrators,

receiving a plurality of response messages in response to the  
broadcast message,

20 determining from the plurality of response messages the plurality  
of access concentrators which are capable of fulfilling predetermined  
service requirements of the node,

selecting from the plurality of access concentrators, an access  
concentrator which sent the first response to the node, so that the node  
can establish a PPP session with the access concentrator.

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21. A network node comprising:

a processor,

a network interface in communication with the processor, and

a memory coupled to the processor, wherein the memory includes

30 instructions for:

receiving a broadcast message,

-22-

determining a load on the processor, in response to receiving the broadcast message, and

waiting a period of time before sending a response message to the broadcast message, wherein the period of time is a function of the determined load on the processor.

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22. In any of the previous claims 18 through 21, the broadcast message is a PPPoE Active Discovery Initiation message.

10 23. In any of the previous claims 18 through 22, the response message is a PPPoE Active Discovery Offer message.